

REMARKS

It is noted, with appreciation, that the Examiner has indicated that claims 8-10 have been allowed, and that claim 5 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1, 3, 6, 11 and 12 have been rejected by the Examiner under 35 U.S.C. § 102(b) as being anticipated by Matsumoto et al. (DE 3820082 A1). This rejection is respectfully traversed.

In a previous Office Action, the Examiner states that element 1 of Figure 1 is a channel plate having ink channels. Furthermore, the Examiner also identifies the actuators as element 1, composed of a piezoelectric member. In other words, the so-called channel plate and actuators are one in the same members. Since the actuators and the channel plate in the present invention are clearly separate members, it is apparent that the ink jet printhead of the present invention is structurally different from that of the Matsumoto patent.

As recited in claim 1 of the present application, actuators are elements respectively associated with each of the ink channels for pressuring ink contained in the ink channels. As clearly explained on page 3, lines 25-30 and page 4, lines 26-30, when operating a printhead, electrical signals are supplied to the individual actuators 22 so that the actuators perform expansion and retraction strokes towards and away from the associated ink channel so that

the ink contained therein can be pressurized causing ink droplets to be jetted out. In other words, the actuator is an element which is responsive to an electrical signal and mechanically activates the ink contained in the associated ink channel. This is further supported by the fact that to achieve this end, the actuator is composed of a piezoelectric material.

The electrodes 8 of the Matsumoto reference are provided on both sides of the piezoelectric plate 1. Electrodes, for example element 8 in the Matsumoto reference and element 24 in the present application are generally known as being electrical conductors. They are used to pass electrical signals to the actuators which, in response to these signals, mechanically activate the ink contained in the ink channel. Electrodes, for example element 8 in Matsumoto and element 24 in the present application, are usually metals which are incapable of performing a mechanical activation. However, a piezoelectric material is capable of mechanical activation when responding to an electrical signal. Thus, it is clear that the piezoelectric plate of the Matsumoto reference is an activator and simultaneously a channel plate, as previously understood by the Examiner.

In an effort to emphasize the distinction between electrodes and actuators, claim 1 has been amended to clearly recite electrodes as a separate element operatively associated with each of the actuators for individually energizing the actuators. This amendment to claim 1 is clearly supported by

the present application at page 3, lines 25-30 and page 4, lines 26-30. Page 3 of the present application recites that the actuator block 20 is made of a piezoelectric ceramic material and has a comb-like structure forming a plurality of parallel, vertically extending piezoelectric fingers 22 and is provided with electrodes associated with each of the fingers 22. A flexible lead foil 24 is attached to the outer surface of each of the actuator blocks 20 and is formed with electric leads for individually energizing the piezoelectric fingers 22. Similarly, on page 4 of the present application, it is recited that when the printhead is operated, electric signals are supplied to the individual piezoelectric fingers 22 via the lead foils 24 so that the piezoelectric fingers perform expansion and retraction strokes toward and away from the associated ink channel 14, so that the sheet 18 covering the ink channel is flexed and the liquid ink contained in the ink channel is pressurized and the ink droplet is jetted-out through the nozzle 16.

As recited in the Applicants previous response to the Examiner's Office Action, the printhead of the present invention comprises a plurality of distinct elements. This being the case, it is possible, for example, to fabricate only the channel plate containing ink channels separately, in a high quality material, thereby reducing both material and manufacturing cost.

Accordingly, in view of the above amendments and remarks, reconsideration of the rejection and allowance of all of the claims of the present application are respectfully requested.

In the event that the proposed amendment does not place the present application into condition for allowance, entry thereof is respectfully requested as placing the present application into better condition for Appeal.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mr. Joseph A. Kolasch (Reg. No. 22,463) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

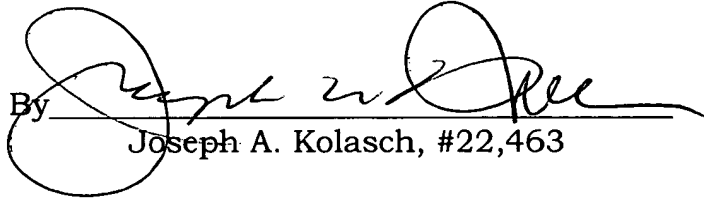
Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicant respectfully petitions for a one (1) month extension of time for filing a response in connection with the present application and the required fee of \$110.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or

1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Joseph A. Kolasch, #22,463

JAK/clb

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000